

Remarks

In view of the above amendments and the following remarks, reconsideration and further examination are requested.

Pursuant to the Examiner's requirement, the title of the invention has been changed so as to be clearly indicative of the invention to which the claims are directed.

The specification and abstract have been reviewed and revised to make a number of editorial revisions. No new matter has been added.

Regarding the objection to the abstract, the above-mentioned changes thereto also include changes to address the objection. As a result, withdrawal of the objection to the abstract is respectfully requested.

The drawings have been objected to because the reference number "248" has been used in the specification to designate both the "rotation controller" and the "color wheel". However, it is noted that the "color wheel" should be labeled with the reference number "246". Therefore, one of the above-mentioned changes to the specification has been made to address this typographical error. As a result, withdrawal of the objection to the drawings is respectfully requested.

Claim 3 has been objected to as lacking proper antecedent basis for the limitation "the light passing part". Claim 3 has been amended so as to address this objection. As a result, withdrawal of the objection to claim 3 is respectfully requested.

Claim 1 has been rejected under 35 U.S.C. §112, second paragraph, as lacking proper antecedent basis for the limitation "the condensed spot". Claim 1 has been amended so as to address this rejection. As a result, withdrawal of this rejection of claim 1 is respectfully requested.

Claims 1, 2, 4-7, 10 and 11 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Huang (US 5,467,146) in view of Tomita (US 5,379,083).

Claims 3, 8, 9 and 12 have been indicated as containing allowable subject matter. The Applicants would like to thank the Examiner for this indication of allowable subject matter.

Claim 1 has been amended so as to further distinguish the present invention from the references relied upon in the rejection.

In addition, claims 1-12 have been amended to make a number of editorial revisions. These revisions have been made to place the claims in better U.S. form. None of these amendments have been made to narrow the scope of protection of the claims, nor to address issues related to patentability and therefore, these amendments should not be construed as limiting the scope of equivalents of the claimed features offered by the Doctrine of Equivalents.

Also, it is noted that new claim 13 has been added.

Claim 1 is patentable over the combination of Huang and Tomita, since claim 1 recites a projection display device having, in part, a shading means for, when a size of the condensed spot on the color wheel has increased due to an increase in light emission of the white light source, shading a portion of the light passing through the color wheel corresponding to the increased size of the condensed spot. The combination of Huang and Tomita fails to disclose or suggest the shading means recited in claim 1.

Huang discloses an illumination control unit 17 for a light source 16. The illumination control unit 17 includes a first set of lenses 23, a color filter 24 that is rotatable by a motor 24a, a second set of lenses 25, an optical shutter 26, a prism 29, a projection lens 29 and a digital micro-mirror device (DMD) 15. In operation, a light beam from the light source 16 passes through the first set of lenses 23 and is focused on the color filter 24. The light beam then is further focused by the second set of lenses 25 to the optical shutter 26. If the optical shutter 26 is open, the light beam is allowed to pass. Otherwise, the light beam will continue no further in the illumination control unit 17. If the light beam passes through the optical shutter 26, it is then directed by the prism 28 to the DMD 15 and finally reflected to the projection lens 29 to be displayed on a screen. (See column 3, line 35 – column 4, line 24 and Figure 2).

In the rejection, it is indicated that the optical shutter 26 corresponds to the claimed shading means. However, as discussed above, the optical shutter 26 operates to either allow the light beam from the second set of lenses 25 to pass, as a whole, therethrough or completely block the light beam. There is no disclosure or suggestion in Huang that the optical shutter 26 operates to, when a size of a condensed spot of the light beam on the color filter 24 has increased due to an increase in light emission of the light source 16, shade a portion of the light beam passing through the color filter 24

corresponding to the increased size of the condensed spot. As a result, it is necessary for Tomita to disclose or suggest this feature in order for the combination of Huang and Tomita to render claim 1 obvious.

Tomita discloses a projector 10 having a light source 11, a lens arrangement 13, an illumination aperture controller 16, a light valve 14, a projection aperture controller 19 and a lens arrangement 17. In operation, light from the light source 11 passes through the lens arrangement 13 and the illumination aperture controller 16. The illumination aperture controller 16 is adjustable to provide a variable illumination aperture to thereby control a degree of collimation of the light reaching the light valve 14. The illumination aperture controller 16 is adjusted so that the projector 10 will have the maximum real contrast and best image quality of an image projected by the light. (See column 2, line 43 – column 3, line 22 and Figure 1a).

In the rejection, it is also indicated that the illumination aperture controller 16 of Tomita corresponds to the claimed shading means. However, the illumination aperture controller 16 is specifically disclosed as operating to adjust the illumination aperture of the light to have the maximum real contrast and best image quality of an image projected by the light. Therefore, the illumination aperture controller 16 adjusts the illumination aperture of the light to maximize image contrast. On the other hand, the shading means recited in claim 1 shades the portion of the light passing through the color wheel corresponding to the increased size of the condensed spot, when the size of the condensed spot on the color wheel has increased due to an increase in light emission of the white light source. There is no disclosure or suggestion in Tomita that the illumination aperture controller 16 is operable to shade a portion of the light corresponding to an increased size of a condensed spot of the light due to an increase in light emission from the light source 11. Therefore, Tomita also fails to disclose or suggest this feature of claim 1.

Since neither Huang, nor Tomita, discloses or suggests the shading means as recited in claim 1, it is apparent that the combination of Huang and Tomita fails to render the present invention as recited in claim 1 obvious.

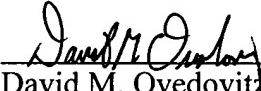
Because of the above-mentioned distinctions, it is believed clear that claims 1-13 are allowable over the references relied upon in the rejection. Furthermore, it is submitted that the distinctions are such that a person having ordinary skill in the art at the

time of invention would not have been motivated to make any combination of the references of record in such a manner as to result in, or otherwise render obvious, the present invention as recited in claims 1-13. Therefore, it is submitted that claims 1-13 are clearly allowable over the prior art of record.

In view of the above amendments and remarks, it is submitted that the present application is now in condition for allowance. The Examiner is invited to contact the undersigned by telephone if it is felt that there are issues remaining which must be resolved before allowance of the application.

Respectfully submitted,

Hideki OHMAE et al.

By: 

David M. Ovedovitz
Registration No. 45,336
Attorney for Applicants

DMO/jmj
Washington, D.C. 20006-1021
Telephone (202) 721-8200
Facsimile (202) 721-8250
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Amendments to the Abstract

Please amend the abstract as follows.

ABSTRACT

A field sequential color projection display device includes a color wheel assembly condensing unit and a shading unit. The color wheel assembly has a color wheel which is divided into a plurality of color regions and a motor for rotating the color wheel. The motor contains a sensor for detecting rotation of the motor and the sensor outputs at least one pulse per one revolution of the motor. The color wheel assembly also has a spatial light modulator for displaying image data that is driving in synchronization with the pulse output by the sensor. The condensing unit condenses light emitted from a light source to form a condensed spot on a color wheel. The shading unit, when a size of the condensed spot on the color wheel has increased due to an increase in light emission of the light source, shades a portion of the light passing through the color wheel corresponding to the increased size.